Black Hills/Colorado Electric Utility Company

Advanced Metering Infrastructure/Meter Data Management System

Abstract

Black Hills/Colorado Electric Utility Company (BHCOE) is one of three Black Hills Corporation subsidiaries deploying advanced metering infrastructure (AMI)—the other two are Black Hills Power (South Dakota/Wyoming) and Cheyenne Light, Fuel and Power (Wyoming). BHCOE's project includes the deployment of smart meters, communication infrastructure, and a meter data management system (MDMS). The project provides improved outage restoration from the integration of an outage management system with the AMI. Two-way communication allows for off-cycle reads, remote connect/disconnect of customer loads, tamper detection, and potential future implementation of time-based rate programs. BHCOE is also deploying approximately 200 direct load control devices as part of a pilot program to understand customer acceptance and load impacts.

At-A-Glance

Recipient: Black Hills/Colorado Electric Utility Company

State: Colorado

NERC Region: Western Electricity Coordinating Council

Total Budget: $12,285,708

Federal Share: $6,142,854

Project Type: Advanced Metering Infrastructure

Equipment

- 42,665 Smart Meters
- AMI Communication Systems
  - Meter Communications Network
  - Backhaul Communications
- Meter Data Management System
- 200 Programmable Communicating Thermostats

Key Targeted Benefits

- Reduced Meter Reading Costs
- Improved Electric Service Reliability
- Reduced Ancillary Service Cost
- Reduced Truck Fleet Fuel Usage
- Reduced Greenhouse Gas and Criteria Pollutant Emissions

Smart Grid Features

Communications infrastructure consists of a wireless mesh network connecting smart meters and strategically placed data collectors that use wireless backhaul solutions. The data collectors relay the smart meter information to the head end system. The two-way communication allows for greater operational functionality and the future addition of new electricity service options.

Advanced metering infrastructure includes the deployment of approximately 42,665 smart meters in addition to about 56,000 existing smart meters, which completes the system-wide deployment. Operational cost savings are derived from the automation of meter reading and customer services activities. New AMI features include outage and restoration notification so that BHCOE can respond to outages and customer requests more efficiently. The AMI system is being integrated with an MDMS to support collection, analysis, and archiving of data for program planning for potential time-based rates, distribution system upgrades, reliability planning initiatives, customer Web presentation applications, and power quality enhancements.

Direct load control devices deployed by the project include 200 programmable communicating thermostats installed in customer homes, which communicate wirelessly through the smart meter, and AMI infrastructure. The thermostats function as direct load control devices for residential central air conditioners. Customers receive a $30 annual credit for participating in the program and allowing BHCOE to raise the temperature of their air conditioner setting by 5 degrees on a maximum of 10 "event days" per year.

Black Hills/Colorado Electric Utility Company *(continued)*

Timeline

Key Milestones	Target Dates
AMI asset deployment begins	Q2 2010
AMI asset deployment ends	Q2 2011
MDMS integration begins	Q2 2011
MDMS integration ends	Q2 2012

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